

# YOUR FIRST 50 TRANS-ATLANTIC COUNTRIES ON MEDIUM WAVE

(And Then Some)

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Anyone who has been following the news over the past twelve years will realize the great degree of change to the political landscape of Europe, largely related to the break-up of the former Soviet Union, the continuing turmoil within the former "Eastern Bloc" countries, and the re-unification of Germany. Africa, too, has been changing. These changes have had a profound influence on broadcasting. Technology, including increased use of FM and digital broadcasting techniques, is shaking things up on the old medium-wave AM band as well. Large stations like Langenberg, Germany (1593) leaving AM in favor of FM may be providing better audio locally, but they do a disservice to more distant listeners. FM can seldom provide nationwide coverage, let alone continent-wide or global reception.

The intention of this article is to assist experienced DXers in preparing themselves to tackle the challenges of DXing the medium wave broadcast band for Trans-Atlantic (TA) signals. It provides the DXer with an updated list of countries in approximate order of reception ease, along with information about best reception frequencies and times. Propagation analysis strategies are also brought into play. Much has been learned from the 1991 and 1993 Newfoundland DXpeditions and from continued monitoring by DXers in eastern Canada (Burnell), New England (Conti, Connelly), New Jersey (Straus), Pennsylvania (Dangerfield), and many others. The South Florida DX Club (Seiden, Crawford, Scotka, et al) has provided insights to MW DX from that TA-viable area. All of these new loggings build upon a bedrock of DX knowledge running back to the work of Nelson, Bailey, and others in the 1960's and earlier.

As most medium wave TA DX is reported by those living in the northeastern USA and eastern Canada, the reception notes have been formulated with this area in mind. Midwestern (Great Lakes Area), Southern (FL, GA, TX, etc.), and Northwestern (OR, WA, BC, etc.) DXers also hear the TAs. Many of the reception notes in this article will be of use to listeners in these areas, but differences do exist. This is especially true with regard to East Coast sunset DXing information which is not applicable to those farther west. Of course, Brian Vernon's loggings from Yukon and the Northwest Territories are a separate TA (more correctly, Trans-Polar) DX case. A strategy for these far-northern Canadian sites would bear little resemblance to that for any DXer in the lower 48 United States, except (perhaps) the Pacific Northwest where auroral "doughnut hole" receptions of high-latitude Russians and Scandinavians can occur with Beverage aerials under prime conditions.

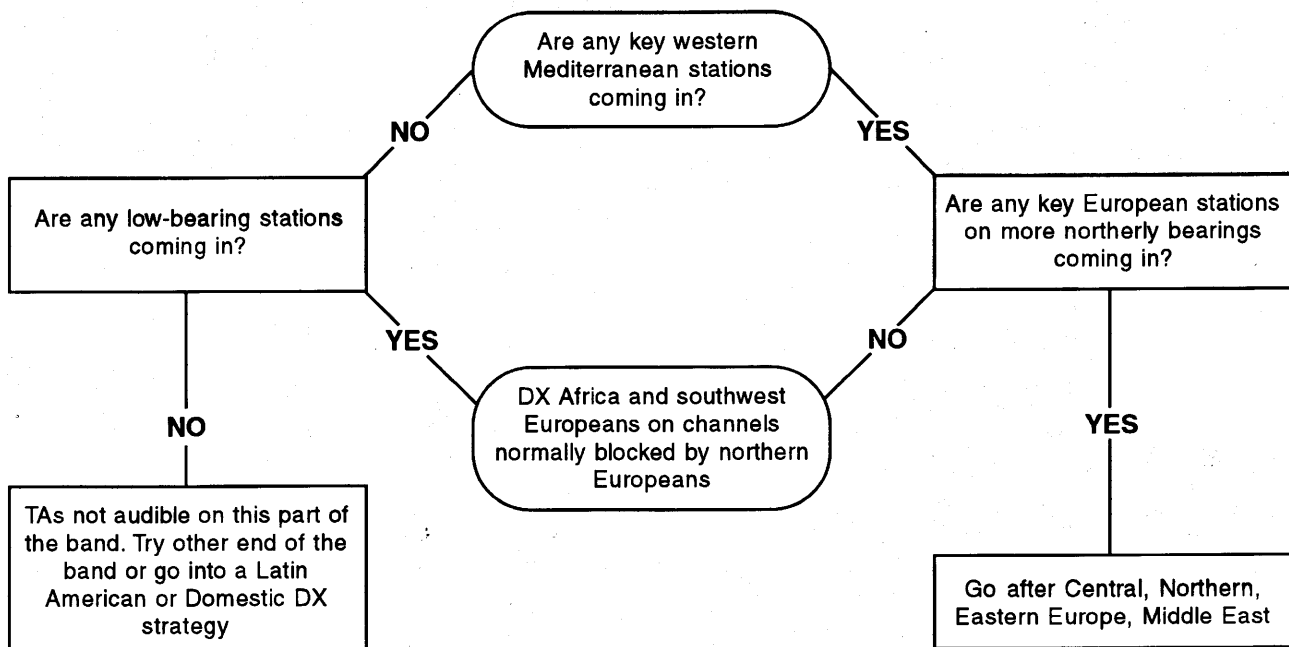
As a preface, the prospective medium wave TA DXer should have access to worldwide sunrise/sunset tables, a copy of the latest *World Radio-TV Handbook (WRTH)*, and a suitable receiver. The receiver and antenna required to hear TA's is dictated largely by the listener's location. Armed with no more than a car radio with whip antenna or an unaided Sony '2010 or Realistic TRF, a DXer will have no trouble pulling scores of TA's if he's at Waterfront Park in Boston at sunset in autumn and winter. Even if it's auroral, some of the high-powered Africans should be audible. For those not lucky enough to be at a perfect site with ocean towards Europe/Africa and obstruction towards most domestics, better receivers and antennas will be required. A good communications receiver with tight filters (e.g. R390A, Drake R8, NRD 535, HQ-180A) and an amplified high-Q tuned air core or ferrite loop, possibly augmented by phased longwires or Beverages, will definitely help you haul in more TA's, regardless of your location. Lesser receivers can be "perked up" by using a regenerative preselector such as the MWT-3 or by using a loop such as the Kiwa or Martens having regeneration capabilities built in. Memories, accurate readout, and synchronous AM detection/ECSS are tipping the scales towards a preference for modern equipment over the tube dinosaurs - especially now that the newer receivers have gotten good enough to compete in hand-to-hand combat with the old Hammarlund, Collins, National, and Hallicrafters sets in basic reception quality (sensitivity, selectivity, and freedom from spurious responses). During a good opening, and especially on a Beverage DXpedition, frequency-hopping agility and the ability to blast through stored parallel channels and propagation-indicator stations can make a big difference. It is unlikely that we would have logged 92 countries on MW from Newfoundland over a long weekend if the team was limited to using 1950's-technology receivers.

The reader is advised to consult the NRC and IRCA reprints lists for excellent receiver reviews and tests by Gerry Thomas, Dallas Lankford and others. Larry Magne is a noted reviewer of receivers; his work has appeared in the *World Radio-TV Handbook*.

Inexperienced DXers should carefully hone their split station tuning skills by practicing on powerful Pan-American splits such as Turks & Caicos - 535 and St. Kitts/Nevis - 895. Keep tables of TV "birdie" frequencies and Latin American splits at hand. Not all non-10 kHz channel signals are from across the Atlantic.

The quickest way to ascertain whether TA DX possibilities exist is to check several frequencies known to have strong signals under even mediocre, let alone good, conditions. The stations checked should be distributed evenly between low- and high-band frequencies, and between lower and higher latitude bearings. Actual stations checked may differ as a function of time.

A working TA DX strategy is outlined by the following block diagram and tables of key stations:



When using the above TA-hunting strategy, you must keep station operating schedules in mind. Consult the *WRTH* and the country-by-country breakdown to follow. The concepts presented in the previous strategy may someday find application when computer-controllable receivers (with programs making decisions based upon signals found and not found) become common.

Most experienced medium wave TA DXers have evolved one or more working schemes, possibly similar to the above. Occasionally, a departure from standard TA hunting schemes in favor of a complete bandscan, or search for split frequency station caused heterodynes from the bottom of the dial to the top, is advisable.

Key stations to use in the "decision blocks" of the strategy diagram are shown on the facing page.

Check WWV (2.5, 5, 10, 15, or 20 MHz) at 18 minutes past the hour from time to time to keep abreast of the A and K index information. Some DXers have found that keeping track of these numbers has helped to give their DX activities a sense of direction and also helped them correlate these indices of geomagnetic activity with real life TA DX propagation patterns. The A index (Afr: A index, Fredericksburg, VA) is that most commonly mentioned in DX circles. It ranges from 0 to over 100. Favorable high latitude TA DX conditions are associated with several consecutive days of low geomagnetic activity (A indices less than 6). Disturbed conditions are indicated by somewhat higher A numbers. Often such conditions produce short skip and/or semi-auroral conditions with low-band receptions limited to the western Mediterranean region of Europe (Spain, Portugal, southern France) and Africa. Higher latitude stations may still get through on frequencies above 1400 kHz. Such stations (e.g. 1539) often exhibit fast flutter type fading. Really auroral conditions occur with high geomagnetic activity (caused by solar disturbances) when the A index soars above 20. The only TA's likely to be heard are Africans well to the south of the Mediterranean coast countries, so check those listed above as "low bearing Africans".

During a heavy aurora, it's best to concentrate on Caribbean and South American DX. The really choice Africans are generally only heard with Beverages at the beach, preferably from outer Cape Cod or Maritime Canada. Such aeriels should be over 400 meters long, aimed at 105 degrees plus or minus 10 degrees bearing away from the DX shack. There are some exceptions: Lesotho - 1197 (one of the few high-band far-south Africans running serious power) is often loggable on a ferrite loop during a good aurora from the Granite Pier DXpedition site in Rockport, MA. Sao Tome -1530 and certain Angolans are loop-receivable at that site as well.

I have found that a loose correspondence between the A indices and real life propagation exists and obtaining these numbers provides an interesting supplement to DX information. However, you should always check key stations using TA strategy similar to that outlined earlier in this article. Never write off a potential DX session before checking actual MW conditions, just because the WWV propagation alert sounds discouraging.

Autumn and winter provide the best TA DX, but some TA's can be heard year-round. Morocco - 1044, Algeria - 891, and numerous Spaniards come to mind. Spring and summer can provide unique opportunities, especially with regard to high-band Iberian peninsula stations. These stations remain in darkness well after the summer sun has risen at co-channel transmitter sites in more northerly countries, such as Germany. Subequatorial Africans have been received in May, a month not generally considered good for DX. Historically, late August through early April has been thought of as the TA DX season. Late September through early January is usually the best part, as the "midwinter anomaly" (thought to be related to the effects of lower ionospheric temperatures) slows things down a bit in the latter part of winter. Around the winter solstice and Christmas, one can profit from the fact that darkness lingers longer in northern Europe than in the Mediterranean, as Algeria - 549 enters daylight and fades, the German on that channel is left in the clear long enough to get reception report details or a good tape recording. A brief sunrise/sunset chart is included as an appendix to this article. More elaborate forms (both map and tabular) are available as NRC and IRCA reprints.

## ID'ING STATIONS

Stations broadcasting in English, of course, present no problem. Unfortunately, such stations represent a very small piece of the Trans-Atlantic DX pie. In regards to non-English language stations, the frequency and the language certainly get you a long way, at least toward a tentative ID. Use shortwave broadcasts to get accustomed to the sound and some of the rudimentary vocabulary of a number of languages from the three major European groups: Germanic, Romance, and Balto-Slavic. If the station is the only one on the channel listed with the language heard, if it has been reported by other DXers in your area, and you hear other stations close in terms of frequency and location to the station in question, you can pretty much log the catch with about 90% certainty. That other 10% of doubt can be removed with reception of a formal ID (generally heard at the top of the hour). These can be an interval signal (some are very distinctive), or in the case of rare commercial stations, advertisements mentioning local cities or brand names peculiar to one country. One must dig for as much identification material as possible, especially if you can't recognize the language being used or if several different countries are on the channel with the same language or similar sounding languages. Stations such as Vatican City, the Albanians, and Radio Sweden may run many different languages within a short time span. Furthermore, what one heard on one of these outlets at a given time one evening may be replaced by programming in a different language at the same time the following night. Format (e.g. rock music or religion), or cities and

## KEY STATIONS: TA DX STRATEGY

### Low Band (500-1000 kHz)

#### Western Mediterranean Region:

Algeria	549, 891, 981
Spain	585, 639, 684, 738, 774, 873, 954, 999
Portugal	666
Morocco	612, 711
France	675, 945
Italy	846

#### Low-bearing African:

Canary Islands	621, 837
Senegal	765

#### Higher-bearing European:

UK	693, 882, 909
Germany	756
Holland	747
Switzerland	765

### High Band (1000-1700 kHz)

#### Western Mediterranean Region:

Algeria	1422, 1544
Spain	1107, 1134, 1359, 1584
Portugal	1035
Morocco	1044, 1053
Albania	1395
France (Monaco)	1467
Malta/France	1557
Tunisia/Azores	1566
Vatican	1530
Italy	1332

#### Low-bearing African:

Canary Islands	1008, 1098, 1179
Mauritania	1349
Angola	1088, 1115, 1367
Lesotho	1197
Sao Tome	1530

#### Higher-bearing European and Middle East:

Norway	1314
UK	1053, 1089, 1215, 1548
Germany	1017, 1269, 1422, 1539
Saudi Arabia	1512, 1521
Slovakia	1098
Denmark	1062
Russia	1386
Sweden	1179
Egypt	1107
Turkey	1017

people mentioned on news broadcasts are supplementary pieces of information which may help to resolve an ID. Parallel frequencies, both medium-wave and shortwave, are great ways to nail down a conclusive ID. The Newfoundland DXpedition reports and regular international column loggings provide much information on parallel frequencies.

Other DXers may be able to dissect information from a tape that, to the original recipient of the signal, sounds like gobbledygook. Tape can be run through analog and digital audio filtering/processing to separate "the wheat from the chaff". Taping of RF (a swath of the band) using a video recorder, a method pioneered by Craig Healy, should emerge as a DX tool of immense benefit if the bugs can be worked out. Imagine scooping up the band as received on a beach Beverage pointed at Africa during a high aurora and having unlimited time to scan over the (4 or 6) hour tape later with your VCR output connected through a tunable preselector to your receiver input! The increasing availability of moderate-cost high-speed digitizers and high-volume disk drives may allow storage of an appreciable-length record of the entire MW band. This could later be digitally-processed to reduce pest-station slop, etc. before returning the stored signals to the analog (RF or detected-audio) world for the DXer.

In the early '70s, a peak period in terms of scientific DXing, DX bulletins published the EBU List with precise frequency measurements and drift data on TA stations. Precision Frequency Measurements (PFM) and Sub-Audible Heterodyne (SAH) analysis techniques were briefly in vogue as additional tools to ID TA's. Gordon Nelson, Ron Schatz, and others went into great detail on such methods. Broadcasters have, in general, made improvements to frequency control that lessen the degree of characteristic frequency "signatures". PFM and SAH analysis as identification tools have, therefore, largely fallen by the wayside. Loop direction-finding may also help, once a DXer has accurately prepared a bearing chart by using both a compass (and/or solar position) and nulls of known TA, LA, and domestic stations locations on a number of frequencies throughout the band. The known-station nulls calibrate out errors due to loop imbalance, nearby metal objects, power-line/wire-antenna reradiation and the like.

TA stations heard, even routine ones, should be reported to the two principal international DX columns. What somebody in Massachusetts or on Long Island thinks of as routine, is probably a good catch in the Midwest. To stimulate DX from sections of the U.S. and Canada away from the prime East Coast sites and to aid in the study of propagation patterns, report all TA's. For those "into" propagation study, the emergence of the home computer has helped to take much of the dirty work out of such studies.

In the list to follow it should be noted that station schedules change, so sign-on and sign-off times are only occasionally given. All times given are in UTC (GMT). Recent DX bulletins, the latest *WRTH*, local sunset, and European/African sunrise charts should be consulted to determine likely times of fade-in, sign-on, sign-off, and fade-out for specific stations.

This list represents fifty selected Trans-Atlantic countries, in approximate order of ease of reception (from Massachusetts). It is based on frequent listening at times evenly distributed between local sunset and transmitter sunrise. (Frequent listening means a daily average of 30 minutes DXing time.)

Note: St. Pierre and Miquelon-1375 is not considered a TA for the purposes of this article.

## CATEGORY A: VERY EASY

**SPAIN:** Spain is on a southerly bearing and is, therefore, less subject to auroral blanketing than stations from northern Europe. Spain has many high-powered, largely split-frequency stations for the new DXer to hear with unsophisticated gear. These stations (mostly government RTVE-RNE outlets) help to tip off experienced DXers to the possibility of receiving the scores of lower-powered private stations in Spain. The high-power channels include 585, 603, 639, 684, 729, 738, 774, 792, 855, 954, 999, 1107, 1134, 1152, and 1359 kHz. Several others are also good, especially at shore sites just after sunset. Local channels, especially 1314, 1413, 1476, 1485, 1503, 1539, 1575, 1584, and 1602 kHz have also provided good DX opportunities. All stations program in Spanish, and music may be either pop or classical. Most are 24-hour operations.

**ALGERIA:** Algiers on 891 kHz is often the strongest TA signal heard in the northeastern states. It is present even during mediocre openings. Therefore, it's a good propagation beacon. Best reception is from one-half hour before local sunset to an hour after sunset. Domestic QRM is at a minimum during this period. Even later in the evening, this station gives WLS a run for its money, heterodyning strongly with it, and on better nights, completely swamping it out. In this case, WLS becomes the het. In such cases, a portable or car radio does fine. Programming on 891 is primarily Arabic music and talk. A few times French has been noted. Other Algerians are frequently noted on 531 and 549 (often parallel to 891). 576, 981, 1422, and others are also occasionally reported. The Algerians are usually heard running all night schedules. The clandestine station on 1544, once thought to be in the West Sahara area south of Morocco, is in Tindouf, Algeria according to the EBU monitors. It is very strong at sunset along the immediate coastline from Florida to Newfoundland, but doesn't seem to have much thrust inland.

**MOROCCO:** Sebaa-Aioun on 1044 kHz with mostly Arabic (but sometimes French) programming is reported fairly often, occasionally mixing with co-channel Spain and others. Parallel 1053 can come in well, giving BBC a challenge on that channel. Arabic talk and music often boom through on 612, 702, 711, 819, and 828 kHz. Moroccans

are heard best at sunset from coastal sites in the northeastern states and the Canadian Maritimes; those in interior areas will do better around 0500 UTC "dawn enhancement". I've logged 1044 from El Paso, TX on a Sony ICF-2010 and small loop and Neil Kazaross has heard it in California. Moroccans noted less frequently are 594, 864, 936, 1080, 1188, 1197, 1233, and 1325 kHz.

**CANARY ISLANDS:** Santa Cruz de Tenerife on 621 kHz is present most nights. Its southerly route allows reception even when Spain and Portugal are "aurora'ed out". Other Canary Islands stations on 837 (mixed with Azores), 882 (mixed with UK), 1008 (with Holland and Spain), 1098 (with the Slovak Republic station), and 1179 (usually atop Sweden) are all solid possibilities. These are consistent performers here in the Boston area around sunset; many also do well at transmitter-site dawn. Theoretically, reception is possible during the entire period of mutual receiver/transmitter darkness; domestic interference considerations, however, point to sunset at the North American receiving site as the best reception time. Conditions conducive to African stations from Senegal (765) and Burkina Faso (747) should bring the Canary Islands stations in with little competition from Europeans. All of the other Canary Islands stations listed in the *WRTH* (e.g. 720, 747, 1269) should be possible under these conditions as this path is relatively low-loss.

**SENEGAL:** Dakar on 765 kHz is among the most consistent TA signals, largely due to its very southerly TA bearing (104 degrees from Massachusetts). Auroral conditions that totally wipe out European reception and severely attenuate Mediterranean-area North African stations frequently leave Dakar unscathed. In fact, a moderate aurora sometimes provides enhancement of 765, in terms of real strength as well as in terms of improved readability due to reduced QRM. This station is generally off the air from 0100 to 0600, although this may vary somewhat. The local sunset period is especially good at coastal locations. The transmitter sunrise period is of possible use to those inland (as well as on the coast) because of higher incoming skip arrival angles although domestic slop is worse than at sunset. This station has been heard in California around 0700 UTC in late autumn/early winter. Dakar - 765 runs French, Arabic, and a variety of local African languages. Music is quite diverse. You may hear Arabic-Islamic chanting, flutes, violins, soul/reggae, or exotic central African folk melodies. The other Senegal stations such as 810, 963, 1224, 1287, 1305, 1323, 1368, 1503, and 1539 are much more difficult, but might be found on a Beverage during aurora.

**SAUDI ARABIA:** Superpowered Duba - 1521 makes this rather-distant Trans-Atlantic country a regular in the autumn and winter from east coast sunset to 2300 and then again at 0300 sign-on. Programming is Arabic music and talk, mostly of an Islamic religious nature. This station really gets out and reception of it from Texas (with KOMA nulled) is not uncommon. The same program is broadcast on several shortwave frequencies. Consult the *WRTH* for these parallels. Less frequently reported are outlets on 648 and 1512 kHz. Al Qurayyat (Guriat) on 900 has been noted sometimes dominating co-channel Italy at DXpedition sites in the Azores and Newfoundland and I logged it from the Boston waterfront (over Italy and CKDH) once. Other big Saudi stations such as 549, 585, 594, and 1440 can occasionally compete with the generally-stronger co-channel European stations.

**FRANCE:** As one of Europe's larger countries (in terms of land area, population, and industrial output), France, not surprisingly, has many powerful transmitters. Many do not operate on a 24-hour schedule, so they are best heard before 2300 and after 0500. Schedules vary, so check recent DX bulletins and the *WRTH*. French talk (including drama) and a wide variety of music may be heard on 675, 711, 837, 864, 945, 1071, 1161, 1206, 1377, 1494, and 1557 kHz. Programs often feature alternating male and female announcers. Parallel frequencies, as well as programs generally in French, help identify these stations. Although longwave is beyond the scope of this article, the superpowered outlet at Allouis on 162 kHz should be mentioned as a TA propagation beacon of sorts. A high-powered transmitter on 1467 kHz, used by Trans World Radio, is located in Roumoules. It is next to Monaco and some count it as Monaco rather than France. Numerous languages, including English, are transmitted on 1467. Consult *WRTH* for current scheduling. The signal from this station is not as consistent as it had been in the '60s and '70s when on 1466. The antennas may have been directionalized to put less signal towards the USA.

**NORWAY:** Kvitsoy-1314 is quite good on higher-latitude evenings. A variety of music, including American and British oldies and recent hits, is featured along with Norwegian talk. The 0300 to transmitter site dawn period yields the strongest signal; earlier in the evening co-channel Spain presents more interference. Few TA's are heard from farther-north sites on a regular basis. Other Norwegian stations are orders-of-magnitude more rare. Westerners may have more luck with northern Norwegian stations than DXers in the East; such stations may skip in the auroral "doughnut hole" and thereby propagate well into the Pacific Northwest and western Canada.

**ENGLAND:** There are many stations in England running high power. Virgin Radio on 1215 is heard well when it's not being QRM'ed by Spain. BBC Foreign Service transmitters on 648 and 1296 kHz, which sometimes run foreign languages, are less consistent in strength than the BBC's English-language domestic channels. Here in the Boston area, 693, 882, 909, 1053, and 1089 have the best signals. Schedules on some outlets have jumped back and forth between 24-hour operation and with a silent period, the latter due to budgetary restrictions. Best reception is during the late autumn and early winter from local sunset to 0000 and then from 0500 to transmitter dawn. The British locals on channels such as 1458, 1485, and 1548 offer interesting challenges quite like domestic "graveyard" DXing.

**PORTUGAL:** Projecting out on the western end of the Iberian Peninsula, Portugal has a relatively low loss path to the USA. Local east coast sunset provides the best opportunity to log Portuguese stations. There are fewer high-powered stations on from Portugal now than there were a few years ago, but the country is still relatively easy to hear. The best frequencies are 1035 and 666. The rocker on 783 has an inconsistent signal: some nights good, but more often wallowing in slop from CFDR, WBBM, and R. Coro (Venezuela). 963 does fairly well and occasionally Vilamoura sneaks in on 891 as the powerhouse Algerian is fading with oncoming daylight. Similarly, there's a Portuguese station that shares 981 with the big Algerian there. I don't know how these guys get out of their own backyards when competing with those North African juggernauts. Some Portuguese stations sign off between 0100 and 0500. When they return to the air around 0500 to 0600, QRM from both co-channel Europeans and stateside stations is generally worse than it is during openings prior to 0100. Those who like even-channel (10 kHz multiple) TA's may find that Radio Comercial on 1170 is one of the easier stations to hear. After daytimers such as WKPE and WDIS go off, WWVA is the major pest. It can be eliminated at most northeast USA/eastern Canada locations by using two-wire, or loop-versus-wire, phasing techniques that set up a cardioid pattern with a null to the southwest. Formerly 720 was a good "even" channel for Portugal, but CHTN has done away with that. For some inexplicable reason (colossally-bad frequency management ?), there are some channels that have co-channel Spaniards and Portuguese (capable of being heard from North American sites) battling each other for dominance. What they must do to each other in their local areas boggles the mind. Portuguese is a somewhat nasal language, intermediate between Spanish and French in sound. Look for high-band lower-power stations such as 1251 and 1377 during the spring and summer around transmitter sunrise when farther-north Europeans are already well into daylight. These unique openings are the "Iberian high-band conditions" popular with numerous DXers on Cape Cod and Long Island.

## CATEGORY B: MODERATELY EASY

**GERMANY:** Although on a less-favorable northern route (bearing 52 degrees from MA), Germany is commonly heard because of the large number of high-powered transmitters there. Langenberg has vacated 1593, but there are still a goodly number of targets for the DXer. Currently 756, 1017, 1269, 1422, and 1539 are the best bets. Germany now includes the former East Germany: the Radio Moscow relay there (in Nauen) on 1323 has English at times. The other stations typically have German talk and varied music including classical, big-bands, show-tunes, and rock. Hard rock with German announcements may be heard on 1422. 1539 may be separated from WPTR with a good receiver on better nights; 549 occasionally overtakes the generally stronger co-channel Algerian. The AFN/VOA stations (873, 1107, 1197) have English, but their signals are mediocre at best and, more often, they're hopelessly buried by co-channel Spaniards. Other Germans on 666, 936, 972, and 1044 are occasionally heard, but they too are at a competitive disadvantage to the various Iberians and North Africans found there. German stations compete more favorably with the lower latitude TA's during the hour preceding German dawn, rather than at US sunset.

**DENMARK:** Try 1062 kHz when mid-band British and Germans are strong. This station has gotten to be a better performer during the 1990's; perhaps its facilities have been upgraded. The removal of a strong Portuguese station from that channel has also helped. It generally dominates over co-channel Italy. Danish talk and a variety of popular music is featured.

**AZORES:** At East Coast sunset, stations on 693, 837, and 1566 are often heard. Programming is in Portuguese. 648, 828, 909, and 1394 are somewhat less common. As the Azores are well to the west of much of the other TA action, listening just before Azores sunrise is very productive. Most of the competition has been lost to daylight by then. Listening to 837 after 0700 UTC in winter is instructive: Canary Islands may be initially dominating, but as time passes, the Azores station rises to complete dominance well before its own fade-out. Lower-powered 828 may be heard best at that time (with Morocco and Spain QRM stripped away). An old-frequency plan straggler on 1259 hets WEZE/CIHI/Spain - 1260 on occasion. A very interesting target is the American Forces station at Lajes on 1503. This flea-powered (100 watt) operation has been positively logged at the "DX Inn" site in Cappahayden, NF and tentatively logged at the Granite Pier site in Rockport, MA.

**VATICAN:** Radio Vatican on 1530 kHz is often logged in the Canadian Maritimes, New England, New York, New Jersey, and eastern Pennsylvania. It mixes with WCKY, sometimes overtaking it, on above-average TA nights. Several languages are used in the religious format of this station. Music played is usually "very soothing" soft instrumentals and classical music. Check shortwave parallels on 5882 and 6245.

**LIBYA:** Tripoli on 1251 kHz now seems to be the most reliable Libyan signal in North America. The heterodyne against the 1250 domestics is strong on many nights, but pulling up readable audio is tricky. When it does surface, the DXer will find Arabic chanting and talking. Co-channel stations on 1251 include Portugal and Hungary. There are other Libyan possibilities on 711, 828, 1053, and 1080: make sure you don't confuse these with co-channel Moroccans. Less common are 675, 792, 909, 1125, 1404, 1449, and 648 (which can be confused with co-channel Saudi Arabia). The best time to listen is from sunset at the listener's location to 2300 UTC and from 0400 until transmitter dawn.

**HOLLAND:** Flevoland - 747 can be a powerhouse when the auroral absorption zone moves sufficiently out of the way. Another Dutch station on 1008 is reported infrequently. Canary Islands/Spain co-channel QRM and WINS slop make this one rough. There's also 675 if you don't have WRKO - 680 as a problem. Holland has a number of pirate stations just above the top of the band. The British club Medium Wave Circle gives these quite a bit of column space. Some of these can span the Atlantic: Jean Burnell in Newfoundland has received several of them. 17. EGYPT The 1107 kHz transmitter at Batra is noted with Arabic programming at North American sunset in autumn and winter. The signal peaks up again as dawn approaches around 0300 - 0330 UTC. As the incoming skip angle is low, a seaside receiving site is advantageous, especially for sunset reception. The presence of Egypt atop Spain on 1107 points the way to other DX targets in that area (such as Turkey, Jordan, Syria, Israel, and Lebanon). Arabic programming heard behind Spain - 774 may be either Morocco or Egypt, so be careful to get positive identification material such as parallel frequencies, interval signal, characteristic time pips on the hour, or a spoken ID. Egyptians on 819 and 864 can also be confused with co-channel Moroccans. Matruh - 1593 has gotten easier now that Germany has vacated the channel.

**MALTA:** The Deutsche Welle relay at Cyclops on 1557 kHz, with programming in Arabic and German is commonly heard after 0300, often mixing with Nice, France. Look for the Deutsche Welle interval signal of shortwave fame heard at 0400, a change from Arabic to German announcements, or the shortwave parallel on 6025.

**SWITZERLAND:** The only really viable channel now is Sottens on 765. This runs French programming and classical music and is often heard well after 0100 when Dakar goes off. Sarnen on 1566 kHz is supposedly testing although it's officially de-activated.

**ALBANIA:** This country's broadcasting organization has been affected drastically by the demise of communism's iron grip. In a move once thought unthinkable, the big transmitter on 1395 is being used by religious organizations including Trans-World Radio. The evening programs, including English, actually get out better than those from the France/Monaco transmitter on 1467. The US/Canada sunset period in winter (2000 - 2300 UTC) yields best reception. Other frequencies such as 648, 1089, 1215, and 1458 have substantial interference from stations in Britain, Spain, and elsewhere. 1395 is your best bet.

**SLOVAK REPUBLIC:** This spin-off country from old Czechoslovakia is much easier to hear than its relative, the Czech Republic. Nitra on 1098 runs big power (1.5 megawatts) and it can roll over co-channel Canary Islands/Spain when northerly propagation paths are active. The Slavic talk comes in well when the major high-band Germans are strong. 702 and 1287 are other channels worth watching.

**MAURITANIA:** Nouakchott is a long-time straggler on the old-plan channel of 1349 kHz. It can be received at sunset during auroras that kill off most other TA's. Sign-off is at 2400 (0000). During auroral conditions favoring reception, the signal is far stronger at the seashore than it is just a few miles inland. Programming includes Islamic cultural content, African and Arabic music, and talk in French and Arabic. Check for the shortwave parallel on 4845 kHz.

**ITALY:** There are several Italian MW frequencies commonly reported by North American DXers. For those not in the splash zone of WHDH - 850, Rome on 846 kHz may be your best bet. This high-powered 24-hour station runs the early morning (Italian time) "Notturmo Italiano" program featuring blocks of music and talk in several languages including English. 900 can occasionally make it in at coastal sites. A shortwave parallel to both 846 and 900 can be heard on 6060. The synchronized stations on 1035, 1062, and 1116 (in parallel) sign-on at 0500. Italy on 1062 has been logged in eastern Massachusetts, despite QRM from co-channel Denmark and slop from WBIV, CJRP, and KYW. 1575 and 1332 are good high-band Italian channels to check and 1116 may be noted mixing with Spain, at least during above-average conditions. If you're lucky, you may be able to slice the 1449 Italian away from the 1450 "graveyard" jumble.

**IRELAND (SOUTHERN):** RTE Athlone - 612 and Tullamore - 567 are your best bets. Best reception is in late autumn and early winter around 0600 to 0700. The outlet on 612 plays pop-rock music; 567 features more discussion programs and traditional folk music. Although Ireland is the closest European country (with a high-power MW station) to North America (the Azores and Iceland are closer, but neither has a MW station in the 100 kW or greater class), the stations on 567 and 612 don't get out as well as many other low-band Europeans. Partly this is due to a high bearing (52 degrees from Massachusetts), but mostly it is because the transmitter sites are in the center of the country in a low valley surrounded by mountains in all directions. If these stations were moved to the west coast of Ireland, say Clifden or Bundoran, the signals would be at least 10 dB stronger here. 567 suffers some co-channel Spain/Portugal QRM and 612 is heavily pestered by Morocco. English is the primary language used, although Gaelic is occasionally noted. If the two main stations are being heard, check lower-powered outlets on 729 and 1278. The Radio na Gaeltachta (all Gaelic language) outlets with their superb folk music programming are unfortunately low-powered. The 963 outlet near Dingle Peninsula is the most likely RNG station to be heard in North America because of its advantageous location. You have to work around potential QRM from Portugal, Tunisia, and Finland -among others. There have been a number of pirate operations in Ireland, though far fewer than in Holland.

**BELGIUM:** Wolvertem - 1512 is good (usually over co-channel Saudi Arabia) at sunset (2000 - 2300 UTC) if you aren't near a "megapest" like WSSH - 1510. They have programming in blocks of languages including English and German. Check the *WRTH* for details. Also, try 1512 around 0600 in winter. 927 can be heard under good TA conditions before 2400 (0000) sign-off and after 0500 sign-on. Programming is usually in Dutch, with pop music often played.

**TUNISIA:** Sfax on 1566 kHz often puts in a powerhouse signal from just before local sunset to 2330 sign-off. Listen for Arabic talk and music. The audio level tends to be low, however, and QRM from co-channel Azores can be heavy at times. Other channels to check are 585 (with Spain), 630 (with Portugal/CFCY/WPRO), and 963 (with Portugal and Finland).

## CATEGORY C: MODERATELY DIFFICULT

**CROATIA:** The parallel outlets on 1125 and 1134 kHz make it in with Slavic talk around transmitter site dawn under good autumn/winter high-latitude openings. A former transmitter on 1143 appears to be inactive. If neighboring Albania on 1395 kHz is unusually loud and the high-band Germans are also strong, give these former - Yugoslavs a try.

**SWEDEN:** Solvesborg on 1179 is noted during the better winter sunset openings atop Canary Islands/Spain stations. Using a phasing system to throw a cardioid null at WHAM can often make all the difference in digging this one out successfully from northeastern USA receiving sites. Look for a variety of programs and languages during the 2000 - 2300 period, including English.

**NORTHERN IRELAND:** The heterodyne from BBC Lisnagarvey on 1341 kHz will show up against the 1340 kHz "graveyarders" many nights from 0600 to transmitter dawn during winter if the English BBC stations are present above 1000 kHz. Slicing audio from the 1340 brouhaha can be tough, though. A strong 1341 signal and a good receiver are necessary. Programming may, at times, be parallel to other BBC outlets. This, and the fact that little else on 1341 can be heard in English, will help you ID this. Sunset period reception of Lisnagarvey (before 2400) is also possible, but sunset often favors lower-latitude propagation to the co-channel Spaniards on 1341. Another Northern Ireland station remotely possible is Belfast on 1026 kHz around transmitter dawn.

**RUSSIA (KALININGRAD):** Bolshakovo on 1386 kHz and on 1143 kHz make it in a few times each winter, usually between East coast sunset and sign-off at 2300. When it's in, it's loud. But the southern edge of the auroral zone has to move quite far to the north. If the middle- and high-band German and British stations are strong, these stations are worth a try. Transmitter dawn openings are also possible. Foreign-service programming, including English, is broadcast in the evening.

**YUGOSLAVIA (SERBIA):** Beograd on 684 (behind Spain, usually) and Pristina on 1413 are your low- and high-band choices respectively. Look for these if big-gun eastern Europeans such as 1098 are in. The status of this country and the other Yugoslav spin-off "countries" such as Croatia, Montenegro, Macedonia, etc. remains in a state of flux.

**HUNGARY:** The parallel transmitters on 1188, 1251, and 1341 are worth chasing. I would rate 1188 the best, as it suffers less co-channel QRM than the others. It does reasonably well in the Boston area with WOWO phased. 540 is a dark-horse possibility, if you can get through a pile of domestics and, conceivably, other TA's. If uncommon low-band Germans are conquering co-channel routine Spaniards, then a distinctly above-average opening is in the works and 540 is indeed possible. Hungarian sounds notably different from the Slavic languages spoken nearby. Listen to Hungarian on a shortwave outlet to gain the ability to identify it.

**POLAND:** Stargard/Stettin-1503 should be checked after 0400 sign-on if the high band Germans are strong. An interval signal (on the hour) using Chopin piano music is a characteristic identifier. Consult the *WRTH* for the schedule of languages used. This is an overseas service transmitter. Harder to hear Polish stations have been noted on 819, 1206 (with France off), and on 1368 kHz.

**AUSTRIA:** ORF Wien on 1476 is the best channel for Austria, but it has greatly reduced its transmission schedule. Look for it around 2000 to 2200 (North American winter sunset) period. Programs are in German and music is quite varied, including electronic and "modern classical" styles. Co-channel interference from stations in Spain is sometimes a problem. There's also an Austrian on 1026 occasionally heard in the USA.

**SUDAN:** If Egypt - 1107 is doing well, try for Rebia, Sudan - 1296 at their 0300 sign-on. The signal can be quite massive when the dawn "greyline" is near the transmitter. An interval signal parallel to 7200 shortwave is used. Arabic talk and Koran recitation (chanting) follows. QRM is largely from Spain, although England and Bulgaria may be rattling around in there as well.

## CATEGORY D: DIFFICULT

**ANGOLA:** Look for Portuguese programs and African music (also American/European pop) on the distinctive "old plan" channels of 944, 1088, 1115, 1313, 1367, 1502, and 1586. Auroral conditions, Beverage aeriels, and a coastal location will help greatly. The best frequency will be largely determined by the DXer's local pests. In eastern Massachusetts, 1088 and 1367 are best, followed by 1115.



**TURKEY:** During good TA DX conditions, Istanbul (Mundanya) - 1017 can be heard, often mixing with co-channel Germany and Spain. Most receptions have been during the late autumn, between 0230 and 0330 with Turkish language programming and music intermediate in style between Greek and Arabic music. Look for this when Egypt - 1107 is rolling over more-common Spain. If this station is strong, consider the propagation door to the Middle East to be open. Have fun going after more exotic catches. Diyarbakir on 1062 has occasionally been reported by North American Beverage users, but it has a lot of co-channel competition from Denmark and Italy, for starters. Other high-powered Turks are listed for 558, 594, 630, 702, 765, 891, 927, and 954, but in every case there's something considerably stronger on each channel from western Europe and North Africa.

**SAO TOME AND PRINCIPE:** The new Voice of America (VOA) outlet on 1530 can do surprisingly well at 0300 sign-on through WCKY and the Vatican. The low-latitude path, high frequency, and high power all help when conditions get auroral enough to weaken the channel's other two major players. It's been logged in the Boston area several times during its first year of operation. Sometimes test tones are run around 0245 - 0255 prior to sign-on. This could be a tip-off to subsequent reception. At 0300 there is news in English, generally followed by a pop music show at 0310. Check 7405 kHz for the VOA African Service parallel. Sao Tome also has a station on 945 (in Portuguese) which could be mistaken for an Angolan. I haven't seen it logged; it might be inactive (or just hopelessly buried by others).

**LESOTHO:** Relay stations of the big international broadcasters have certainly helped put some formerly-rare countries within reach of North American DXers. Besides Sri Lanka and Sao Tome, Lesotho comes immediately to mind. The BBC relay on 1197 from this nation surrounded by South Africa can provide some real long-haul DX (7000+ miles) for us. It has been logged in Newfoundland, Massachusetts, and Florida as of the end of 1993. As more DXers find out about this one, other loggings will likely follow. Best reception has been during moderate aurora about an hour after receiver sunset. Look for BBC English programming parallel to 5975 and 6175 shortwave (Sackville, NB) and 1160 medium-wave (Bermuda).

**GABON:** Melene has sporadically been heard on 1554 kHz (an old-plan channel). This runs parallel to 4777 kHz shortwave, so checking this may be beneficial. Most reports of 1554 mention 2300 as a good reception time. Drum-oriented African music is the usual format. If this moves to 1557, reception will be much less likely, due to WQEW slop and France/Malta co-channel interference. Reception of Gabon seems to be as common in the southeast (Florida and Georgia) as in New England. Moderate aurora will help reception. There are Gabon outlets also listed for 549, 990, and 1575 in the 15 kW - 20 kW range, but hearing these would definitely require the optimum Beverage - beach - aurora combination.

**MADEIRA:** Portuguese language outlets on 531, 603, and 1530 have been logged in New England and Maritime Canada. All face substantial QRM on their respective channels. The right combinations of aurora, sunset or sunrise line placement, and directivity of the antenna/receiving location set-up can help pull these out. One should be advised that Portuguese heard on 1530 at sunset can be from WDJZ, a daytimer in Connecticut. Listen carefully before putting this one in the book. The 531 and 603 stations run 24 hours; Madeira - 1530 signs off at 0000 (0100 Saturday) and signs on at 0600. Other Madeira outlets on 1017, 1332, and 1485 are low-power relays not likely to be heard over stronger co-channel TA's.

**UKRAINE:** Over the years, Mykolayiv on 972 has been logged by Kazaross (ME), Bailey (MA), Dangerfield (PA), and Hakiel (NY); their locations are apparently conducive to eastern European DX. Ukrainians on 1242, 1377, 1404, and 1431 were heard well along with 972 from Cappahayden, NF during the October 1993 DXpedition. The report from that DXpedition is a valuable reference for TA DX in general, but especially for the eastern Europeans that are heard much less frequently on this side of the Atlantic than the routine Spaniards, Moroccans, etc. Sunset (2000 - 2200) reception from the shore and later (approx. 0300) general reception periods are suggested for stations in the Ukraine, Russia, and neighboring areas.

**ROMANIA:** During a good opening to eastern Europe, Romanians can compete with the more common TA's on 558, 756, 855, 1053, 1152, and 1179. Most of these frequencies were logged on the 1993 Newfoundland DXpedition and some have reached the USA. Best reception tends to be during the 0400 - 0500 dawn-enhancement slot in late autumn and early winter.

**BULGARIA:** Every year a few Bulgarians are reported, usually by Beverage users. Some of these are on 576, 594, 747, 774, 828, 864, 1161, 1224, and 1296 kHz. Try for these on top-notch TA nights when other high-latitude Europeans are loud. It's wise to consult the *WRTH* for both the times of Bulgarian station operation and the times when the stronger western European and North African stations sharing channels which share channels with the Bulgarians are off. Although sunset (2000 - 2200) reception is possible at coastal sites, you'll usually do better around 0300 - 0400. The 1224 outlet has been heard at 2300 relaying the VOA ... how times change !

**LUXEMBOURG:** Marnach on 1440 kHz became tougher to hear than it had been back in the "old days" on 1439, but up till a few years ago, it was periodically heard in the northeastern USA - usually on dawn enhancement around 0500. Recently it has cut out English language programs and it has gone to a schedule with sign-off at 2400 (0000) and sign-on well after transmitter-site dawn. So now, with reception limited to the immediate post-sunset period and with

heavy co-channel domestic QRM, it is MUCH harder to log from the USA. Even at the best shore sites at sunset in November and December, it's moderately difficult. At least receiver selectivity isn't too necessary, just lucky propagation. Italian and German programs are those most likely to be heard at the admittedly-limited times of possible North American reception. If Germans on 1017, 1269, 1422, and 1539 are strong, getting Luxembourg seems likely.

**SCOTLAND:** The BBC outlet on 810 can be parallel-checked to several BBC England channels. 810, unfortunately, is often a stew of QRM including, but not limited to, co-channel CJVA, WGY, Colombia, Puerto Rico, Bahamas, Venezuela, Brazil, and Spain ! That's a lot of crud with which to contend. Really solid openings to the UK around transmitter-site dawn in late autumn/early winter might bring this catch as well as other stations from Scotland on 1035, 1152, and 1449.

**OMAN:** Look for BBC programming from Masirah Island on 1413 during the sunset period and at dawn enhancement around 0300. QRM from Spain and Serbia can be rough (not to mention to slop-bruising by CIGO, WPOP, and others on 1410). BBC on 702 is not as often heard. There is also an Arabic-language station on 1242 best heard around 2100 with programs parallel to 6085 shortwave. Bruce Conti found this one on the '93 Newfoundland DXpedition. If you're getting any kind of signal from these long-haul Persian Gulf stations, then conditions just might be good enough for juicy catches from Iran, Iraq, Qatar, UAE, India, and Sri Lanka.

**BENIN:** Cotonou is still on old-plan 1475 kHz and it can be split away from Spain and the others on 1476. Its signal isn't too strong. Auroral conditions certainly help: its signal level would be maintained while 1476 European competition would be removed. From local sunset to 2400 (0000) and from 0400 to Benin dawn are the working times of interest. 4870 kHz may be useful as a shortwave parallel.

**BURKINA FASO:** Ouagadougou on 747 kHz is your only real shot at this country unless you're running Beverages from Newfoundland during auroral conditions. Sunset is definitely the best time to bag 747. Look for a strong signal from Senegal on 765 compared to a weaker signal from Spain on 774 (signalling slightly auroral conditions conducive to good African reception with reduced interference from Europeans). If Senegal is blasting in, then you'll have a good chance of hearing Ouagadougou on 747. Hit this early in the evening, as domestic skip/slop and increased atmospheric/storm noise tend to diminish reception possibilities later. You may hear African music and talk in French and local languages at an apparently low modulation level. As with all local sunset period DX, especially below 1000 kHz, the receiving site should be as close as possible to salt water in the direction of DX for optimum results. Shortwave parallels to 747 are on 4815 and 7230. There is a 10 kW station on 1008 that might make it in during aurora. Neil Kazaross heard it when he was in Ogunquit, ME.

**RUSSIA (EUROPEAN):** Most countries lists consider "mainland" Russia a separate country from its Kalinin-grad section. St. Petersburg on 1494 is your best bet on transmitter site dawn enhancement in autumn and winter. It runs foreign service programming at times. With BBC moving off of 1089 soon, the Russian there may become easier: phasing WBAL is still the biggest challenge. Other stations such as 810 and 1116 are only likely during the best openings at coastal sites.

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It should be noted that Ceuta, a not-too-difficult catch when on 1585.2, has gotten much tougher now that its frequency has been corrected to 1584.

The next countries to hear from across the Atlantic, after those listed so far, may be some on the chart on the facing page. Note that the order is alphabetical, not ranked on difficulty. Some may find a few of these to be easier than some of the first 50 countries enumerated above - ease of reception is, after all, influenced by many factors.

Surprisingly, many of these HAVE actually been heard by MW DXers in Canada and the United States.

The following countries are propagationally-possible, but do not have medium-wave operation at the present time: Andorra, Burundi, Cape Verde, Equatorial Guinea, Ghana, Liechtenstein, Rwanda, San Marino, Tristan da Cunha, Zimbabwe.

ADDITIONAL TA DX TARGETS			
Afghanistan	1107 1206	Kenya	540 612 702 746 846 900 954 981
Armenia	864 1314	Kuwait	540 1134 1341
Ascension Island	1485 1602	Kyrgyzstan	882
Azerbaijan	801 1296	Latvia	1350
Bahrain	612 801	Lebanon	837 873 953
Balearic Islands	909	Liberia	558
Bangladesh	693	Lithuania	666 1557
Belarus	549 1566	Lebanon	836 or 837
Bophuthatswana	540 1098	Macedonia	810
Bosnia - Hercegovina	612 945	Madagascar	630
Botswana	621 648 972	Malawi	594 675 756
Cameroon	899 972 999 1106 1152 1286 1448	Mali	684 819
Central African Rep.	1440	Mayotte	1458
Ceuta	1584	Melilla	972
Chad	840	Moldova	594 999 1449 1467
Channel Islands	1116	Monaco	702 (see France for 1467)
China	1521	Montenegro	882
Comoros	1089	Mozambique	737 872 1008 1295
Congo Republic	863 1476	Namibia	594 747
Cyprus	963 1233 1323	Niger	1125
Czech Republic	639 954 1287	Nigeria	593 657 909 918 1170 1395 others
Djibouti	1170 1539	Qatar	954
Estonia	1035 1215 (?)	Reunion	666 729
Ethiopia	855 873 945	Somalia	962
Faroe Islands	531	Spanish Morocco (Sahara Rep.)	990 1355
Finland	558 963	Saint Helena	1548
Gambia	648 747 909.8	Seychelles	1368
Gibraltar	1458.2	Sierra Leone	1206
Greece	729 792 981 1179 1260	Slovenia	918
Greenland	700 720	South Africa	558 576 603 702 846 1035
Guinea	603 1386 (1404 inactive)	Sri Lanka	1548
Guinea-	666 738 1400 1485 (all low power)	Swaziland	954 1170 1377
India	1071 1134 1566	Syria	783 918 1125
Iran	1404 1449 1566	Tanzania	603 621 648 657 711 1215
Iraq	1530 (clandestine) 1035? 1197	Togo	1394 1502
Isle of Man	1368	Uganda	576 639 729 999
Israel	738	United Arab Emirates	729 1251 1314 1476 1575
Ivory Coast (Cote d'Ivoire)	1493 1578	Wales	1125
Jordan	801 1494	Yemen	792 1008 1188
Kazakhstan	549	Zaire	1160
		Zambia	549 630 818 828 1071 others

**SUNRISE/SUNSET TIMES FOR TA DXers (times = UTC, 15th of month)**

*SUNSET: NORTH AMERICA (receiving end of path)*

Month	Denver	Chicago	Miami	Washington	Boston	St. Johns, NF
JAN	2340	2228	2239	2155	2120	1949
FEB	0013	2303	2257	2226	2156	2032
MAR	0049	2342	2317	2301	2235	2120
APR	0129	0025	2339	2340	2319	2213
MAY	0202	0100	2357	0011	2355	2257
JUN	0222	0121	0008	0030	0017	2323
JUL	0215	0114	0004	0023	0009	2304
AUG	0146	0043	2349	2356	2338	2236
SEP	0109	0003	2328	2320	2257	2146
OCT	0030	2321	2306	2242	2214	2055
NOV	2353	2242	2246	2207	2134	2006
DEC	2333	2220	2235	2148	2112	1939

*SUNRISE: EUROPE/NORTH AFRICA/NEAR EAST (transmitting end of path)*

Month	Senegal	Portugal	England	Germany	Italy	Turkey	Saudi Arabia
JAN	0733	0748	0759	0701	0632	0514	0336
FEB	0724	0717	0708	0617	0558	0442	0319
MAR	0712	0643	0613	0528	0519	0406	0259
APR	0700	0604	0512	0434	0436	0325	0237
MAY	0650	0532	0421	0350	0400	0252	0219
JUN	0644	0514	0349	0323	0339	0233	0209
JUL	0646	0521	0401	0333	0347	0240	0213
AUG	0654	0547	0446	0411	0417	0308	0228
SEP	0706	0623	0543	0502	0457	0345	0248
OCT	0718	0701	0642	0554	0540	0425	0310
NOV	0730	0736	0739	0644	0619	0501	0329
DEC	0735	0755	0811	0711	0640	0521	0340