

# HYPER-FIX

## System Summary



### FEATURES

- 24 hour operation up to 250 km from stations
- Range Range and Hyperbolic operation
- Six simultaneous position lines
- High Accuracy — Resolution 0.001 lanes internally, rounded to 0.01 for display purposes
- Continuous Ambiguity Resolution
- Multi-purpose Receiver/Controller
- Flexible/Extendable chain configuration
- Digital Processing ensures all units are interchangeable without performance degradation
- Rapid deployment — less than one hour
- Remote Control and Monitoring

## BRIEF DESCRIPTION

Hyper-Fix is a third generation medium frequency phase comparison positioning system using microprocessor techniques. The range and accuracy show an improvement over earlier equipments. The system radiates frequencies in the band 1600 kHz to 3400 kHz and depends on the groundwave mode of propagation.

A chain consists of from three to eighteen transmitting stations. One station transmits the trigger signal which controls the timing of the chain. At each station the phase of the transmitted signal can be referenced to the signal from any other station to provide optimum performance and coverage of the chain.

Transmitting station equipment includes a sectional monopole antenna available in different heights from 10–30 metres to meet operating range requirements.

## FREQUENCIES

Two frequencies between 1600 kHz and 3400 kHz.  
Recommended separation is in the range of 2% to 10%.

## RANGE

Up to 700 km (by day), 250 km (at night)

## ACCURACY

Depends on propagation, geometry and instrumental factors, and corresponds to 0.01 lane under the best conditions. On the baseline 0.01, lane represents 0.44 m at 3400 kHz and 0.94 m at 1600 kHz.

## MODES

Mode 1 (Cycle time 0.60 sec)

Hyperbolic — unlimited users (up to five patterns)  
or Ranging — one ship (up to five patterns)

Mode 2 (Cycle time 0.62 sec)

Ranging — two ships (up to four patterns)

OR

Hyperbolic — unlimited users (up to four patterns)  
and Ranging — one ship (up to four patterns)

Mode 3 (Cycle time 0.76 sec to 2.04 sec)

Mode 3 is divided into three sequences, each of which may be Mode 1 or Mode 2 as defined above, giving a range of options from unlimited user (fifteen patterns hyperbolic) to six ship (four pattern ranging).

## REMOTE CONTROL

The chain parameters may be controlled and the units monitored from any transmitting station using the normal radiated frequencies.

## ANCILLARY EQUIPMENT

A number of standard data output formats is available. These allow commercially available peripherals to be employed.

e.g. RS232, IEEE 488, RS422 etc.

## MAJOR COMPONENTS

**Receiver/Controller** — This acts as the Shipborne Receiver, the Monitor Receiver or the Transmitting Station Control Unit. Selection of the required configuration is made through the keyboard (refer to TIL 12-15).

**Power Amplifier/Battery Charger** — Performs the dual functions of amplification of R/F output from the Receiver/Controller to a level suitable for transmission, and provision of a charging current to standby batteries (refer to TIL 12-17).

**Antenna Tuning Unit** — A dual frequency unit which matches the Power Amplifier into Transmitting Antennas from 3 m to 30 m over the 1600 kHz to 3400 kHz frequency range (refer to TIL 12-19).

**Secure Supply Unit** — The internal battery pack in the Secure Supply Unit will power a shipborne or monitor receiver for approximately eight hours. The Secure Supply Unit can also be supplied with an Atomic Frequency Standard which provides a very stable frequency source enabling the utilisation of long time constants to overcome the short term effects of ionospheric disturbances.

**Supply Protection Unit** — This provides protection against lightning strike on the antenna or mains input cable. It also provides the point of single earth connection for the system. The unit can be supplied with a battery pack which will power the Transmitting station for approximately eight hours in the event of a primary power failure.

**Receiving Antenna Assembly** — This is a broadband (1500 kHz to 3000 kHz) active receiving antenna complete with built in Antenna Matching Unit. It is used both with shipborne and monitor receiver installations (refer to TIL 12-21).

**Transmitting Antenna Kits** — There is a selection of transmitting antenna enabling the user to select one which suits his individual requirements (refer to TIL 12-6).

**Interconnecting Cables** — There is a complete range of interconnecting cables, most of which are available in a range of lengths to suit individual requirements.

**Remote Display/Keyboard** — This enables the operator to execute all commands to the Receiver/Controller from a position remote from the station equipment position.

## PERSONNEL

Onboard: One operator.

Ashore: No operator. Battery servicing and security guard may be necessary.

## MAINTENANCE

The equipment is designed for field maintenance by plug-in board and sub-assembly replacement.

## APPLICATIONS MANUAL

STM 1201

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