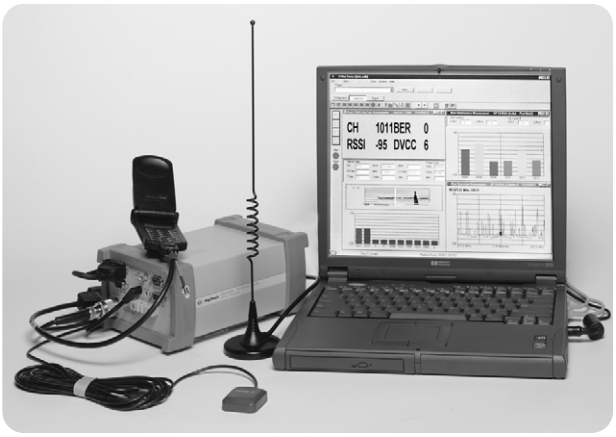
Agilent
E7474A TDMA Drive-Test System
Configuration Guide



The Agilent Technologies E7474A TDMA drive-test system is used to obtain RF coverage and service performance measurements for wireless communications networks, using IS-136, IS-54 and AMPS technologies. A PC interfaces with an Agilent digital RF receiver and/or a TDMA mobile phone. The system can control up to four receivers and four phones simultaneously.

Agilent Technologies

The Agilent E7474A TDMA drive-test system offers several configurations:

- ❑ Phone-based systems
- ❑ Receiver-based systems
- ❑ Combined phone- and receiver-based systems

The purpose of this configuration guide is to assist you in ordering the correct system configuration for your application. It is designed to be used in conjunction with the *Agilent E7474A Drive-Test System Specifications* (literature number 5968-5556E) which describes the features and functions in detail. This document is divided into six parts:

- ❑ Part 1: Basic description of product configuration
- ❑ Part 2: Software options
- ❑ Part 3: Receiver hardware options
- ❑ Part 4: Accessories
- ❑ Part 5: Upgrading existing systems[1]
- ❑ Part 6: Ordering examples

1. Example: You currently own an Agilent E7474A system with phone-only based measurement capability, and you want to upgrade to a combined phone-and receiver-based measurement capability.

Part 1: Basic description of product configuration

The system is made up of software, receiver hardware and accessories. To order a system:

1. Choose the software function that you want from option numbers in the 100's (see figure 1, page 4).
2. Choose the receiver hardware that you want from option numbers in the 300's (see figure 1, page 4).
3. Choose the accessories that you want from the Agilent 86154A and E6473A drive-test system accessories (see figure 1, page 4).

Each system requires either an Agilent digital receiver, TDMA phone, or both. Currently the following TDMA phones are supported:

- Motorola StarTAC ST7790 TDMA/AMPS-800 MHz
- Motorola StarTAC ST7797 TDMA/AMPS-800/1900 MHz

In addition to a PC with Windows® 95, 98 or NT® that runs the measurement software, a navigation system, such as a GPS receiver and GPS antenna, is required to log the position information.

IMPORTANT: At least one option must be ordered for the product configuration to be valid.

Figure 1. Illustrates how to choose the specific options to order with your E7474A system.

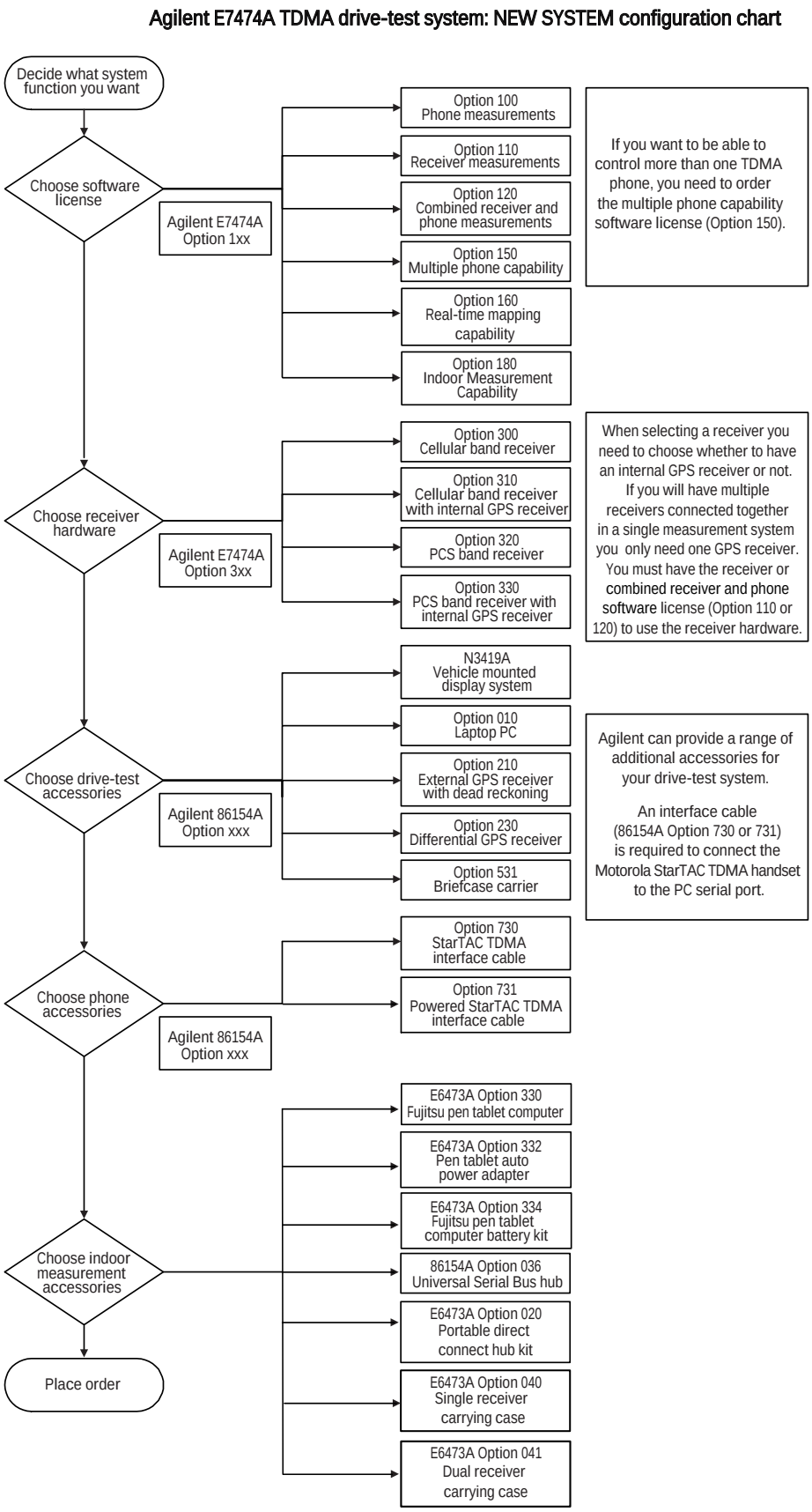


Figure 1. Ordering decision process

Part 2: Software options

Following is information for ordering a new system software function. If adding function to an existing system, refer to Part 5: *Upgrading existing systems.*

The following software options are available on the Agilent E7474A:

- ❑ Option100: TDMA phone-based system software license
- ❑ Option110: TDMA receiver-based system software license
- ❑ Option120: TDMA combined phone- and receiver-based system software license
- ❑ Option150: TDMA multiple phone capability software license
- ❑ Option160: Real-time mapping software license
- ❑ Option180: Indoor measurement capability

Use Table 1 below to determine which software option(s) are required for your application. For a detailed description of the function, please refer to the *Agilent E7474A Drive-Test System Specifications* (literature number 5968-5556E).

Table 1. Software function

Desired function	Software option(s) required
Phone-based drive system measurements (single phone)	Option 100
Phone-based drive system measurements (up to four phones)	Option 100 AND Option 150 [1]
Receiver-based drive system measurements (up to four receivers)	Option 110
Phone-based drive system measurements (single phone) AND Receiver-based drive system measurements (up to four receivers)	Option 120
Phone-based drive system measurements (up to four phones) AND Receiver-based drive system measurements (up to four receivers)	Option 120 AND Option 150 [1]
Indoor measurement capability (can be combined with all other software functionality)	Option 180 (can be combined with any or all other software option numbers)
Real-time mapping capability (can be combined with all other software functionality)	Option 160 (can be combined with any or all other software option numbers)

Each software order includes the following components:

- CD with software and documentation
- Getting started guide
- Software license key (attaches to PC parallel port or USB port depending upon your PC configuration being used).

Options 100, 120 and 150 each include a Socket I/O ruggedized dual serial port PCMCIA card for connecting phones to the PC.

IMPORTANT: Special cabling is required to connect the TDMA handsets to the PC. For the Motorola StarTAC phone, order 86154A option 730 or 731. Refer to Part 4: Accessories.

IMPORTANT: A pen tablet is highly recommended for indoor measurements. Order E6473A Option 330.

1. If Option 150, 160 or 180 is ordered together with Option 100, 110 or 120 the software licenses will be placed on a single security key. If Option 150, 160 or 180 is ordered as an up-grade it will be supplied on its own on a security key. The license can then be transferred to the customer's existing security key using the supplied license manager software.

Part 3: Receiver hardware options

Following is information for customers ordering new RF receiver hardware. If you are adding function to an existing system, refer to Part 5: *Upgrading existing systems*.

The following digital receiver hardware options are available on the Agilent E7474A:

- ❑ Option 300: Cellular band digital receiver
- ❑ Option 310: Cellular band digital receiver with internal GPS Receiver
- ❑ Option 320: PCS band digital receiver
- ❑ Option 330: PCS band digital receiver with internal GPS Receiver

Software Option 110 or 120 is required to operate Agilent receivers. One software package can control up to four receivers.

You may select a measurement receiver with or without an internal GPS receiver. Internal GPS provides portability and simplifies system configuration. If you require dead-reckoning with your GPS, you need to use an external GPS and should not select a receiver with internal GPS. Agilent RF receivers with internal GPS can not be used with an external GPS. Agilent offers an external GPS with dead-reckoning capability. Refer to Part 4: *Accessories*.

For receiver specifications and a detailed description of the receiver functions, please refer to the *Agilent E7474A Drive-Test System Specifications* (literature number 5968-5556E).

Select the receiver that covers the frequency band (cellular or PCS) in which you want to make measurements. If you need to make measurements in more than one band, you need to order multiple measurement receivers.

In multiple receiver configurations, only one of the receivers requires GPS. If you are using multiple receivers in your system, you should only select ONE of the receivers with internal GPS.

Each receiver includes the following components:

- Magnetic-mount RF antenna for the corresponding frequency band
- TNC-to-typeN adapter for RF antenna
- RS-232 cable for connection to PC
- Cable to connect multiple receiver configurations
- AC/DC power supply
- DC power cord – cigarette lighter type
- Mounting kit – brackets and screws for mounting receiver in a vehicle

The receivers with internal GPS receivers (Options 310 and 330) also include the following components:

- Bulkhead-mount GPS antenna with cable
- Magnetic-mount GPS antenna with cable

The bulkhead-mount GPS antenna is recommended for long-term or permanent installations. The magnetic-mount GPS antenna is intended for short-term installations.

Part 4: Accessories

Order the Agilent E7474A accessories using the drive-test system accessories model numbers. The accessories model numbers provides ease-of-ordering for all drive-test system products.

Table 2 lists the accessories available for the Agilent E7474A TDMA Drive Test System. Items listed under "Optional System Accessories" are typically ordered with a E7474A system. Items listed under "Replacement Accessories" are ordered as additional or replacement parts.

Table 3 lists the phone accessories needed to connect the phone to the PC.

Table 4 lists all the accessories available for the E7474A Indoor Measurement System (E7474A option 180).

Table 2. Accessories

E7474A optional system accessories	E7474A replacement accessories
86154A	86154A
❑ Option 010 – Laptop PC	❑ Option 099 – Multiple Receiver Interconnect Kit
❑ Option 210 – Trimble Placer GPS 455 with dead-reckoning	❑ Option 410 – PCS Band Magnetic-Mount RF Antenna
❑ Option 230 – Differential GPS Receiver	❑ Option 430 – Cellular Band Magnetic - System Mount RF Antenna
❑ Option 531 – Briefcase Carrier	❑ Option 510 – Vehicle Mounting Kit
❑ N3419A – Vehicle Mounted Display	

Table 3. E7474A phone accessories

86154A
❑ Option 730 – Interface Cable for Motorola StarTAC TDMA Phone
❑ Option 731 – Powered Interface Cable for Motorola StarTAC TDMA Phone

Table 4. E7474A indoor measurement accessories

E6473A
❑ Option 330 – Fujitsu Pen Tablet Computer
❑ Option 332 – Fujitsu Pen Tablet Computer Auto Power Adapter
❑ Option 334 – Fujitsu Pen Tablet Computer Battery Kit
❑ Option 020 – Portable Direct Connect Hub Kit
❑ Option 040 – Single Receiver Carrying Case
❑ Option 041 – Dual Receiver Carrying Case
86154A
❑Option 036 – Universal Serial Bus Hub

For a detailed description of these accessories, please refer to *Agilent E7474A Drive-Test System Specifications* (literature number 5968-5556E) and *Indoor Wireless Measurement System Product Overview* (literature number 5968-8691E).

Part 5: Upgrading existing systems

The Agilent E7474A is a scaleable system. You can start with one set of capability and integrate additional capability later. The following are some examples:

- Start with a phone-based system and upgrade to include receiver-based measurements
- Start with a receiver-based system and upgrade to include phone-based measurements
- Start with a single phone system and upgrade to provide multiple phone capability
- Start with a phone-based system and upgrade to include indoor measurements

The system is made up of software, receiver hardware and accessories. Upgrading a system is similar to ordering a new system. To upgrade a system:

1. Decide what system capability you want
2. Identify the capability you currently have
3. Choose the software options that you need to add (option numbers in the #100's), refer to Part 2: *Software options*.
4. Choose the hardware options that you need to add (option numbers in the #300's), refer to Part 3: *Receiver hardware options*.
5. Choose the accessories that you need to add, refer to part 4: *Accessories*.

Figure 2 illustrates how to choose the specific options to order to upgrade an E7474A system.

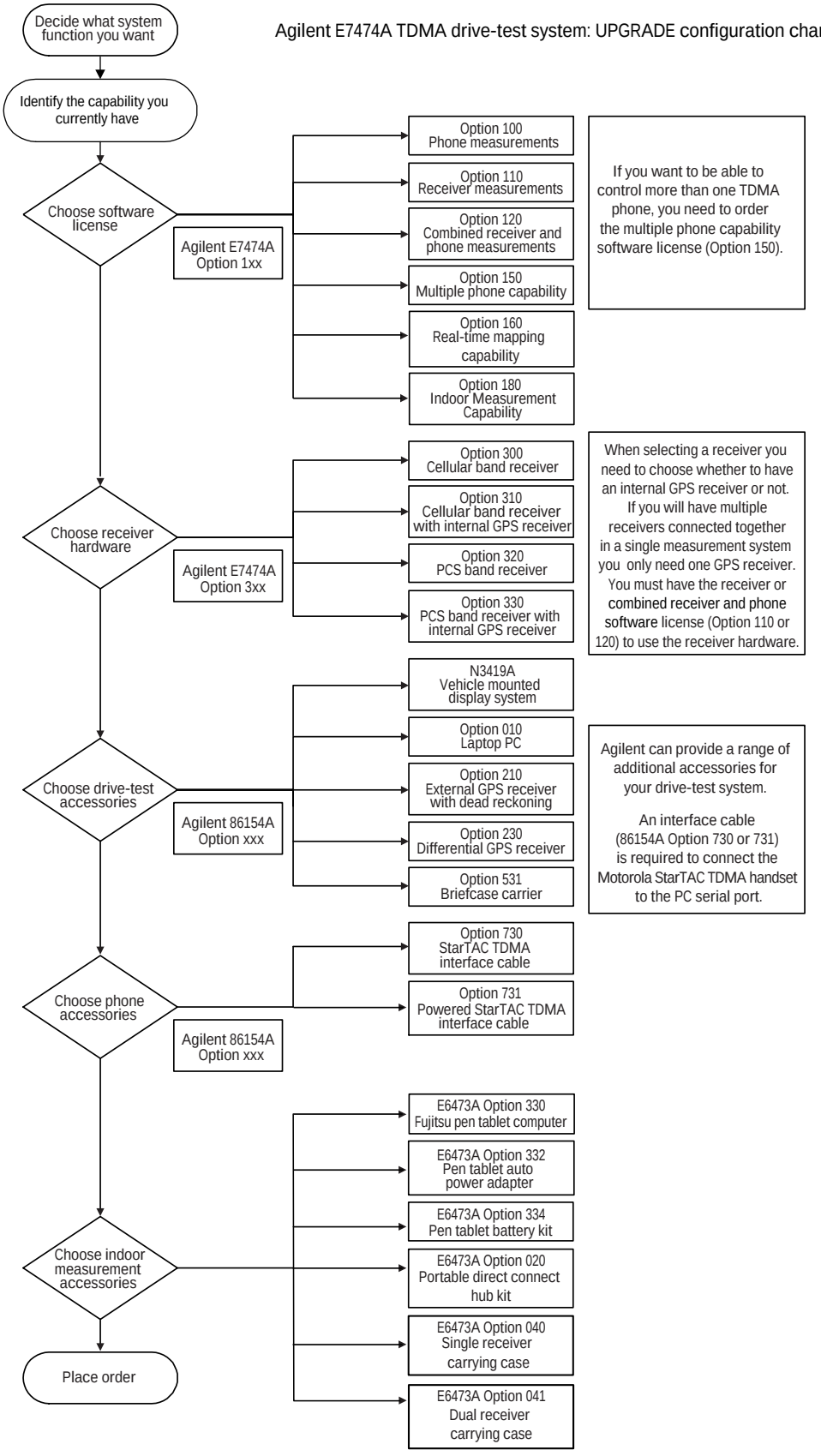


Figure 2. Upgrade ordering decision process

Part 6: Ordering examples

Table 3 lists several typical E7474A system configurations along with the products and options that need to be ordered. Please note: this is **not** a complete list of all possible configurations.

Table 3. Typical ordering configurations

Desired system capability	You need to order:	Description	Quantity
Phone-based measurement system (four phones). Cable with power for each phone. You will provide your own GPS, laptop, and StarTAC TDMA phone.	Agilent E7474A	Drive-test system	1
	Option 100	Phone measurement software	1
	Option 150	Multi-phone measurement capability	1
	Agilent 86154A	Drive system accessories	4
	Option 731	Powered interface cable for StarTAC TDMA phone	4
Receiver-based measurement system for the cellular band. Carrying case for the system. You will provide your own GPS and laptop.	Agilent E7474A	Drive-test system	1
	Option 110	Receiver measurement software	1
	Option 300	Cellular band RF digital receiver	1
	Agilent 86154A	Drive system accessories	1
	Option 531	Briefcase carrier	1
Receiver-based measurement system for the cellular band with internal GPS. Carrying case for the system. You will provide your own laptop.	Agilent E7474A	Drive-test system	1
	Option 110	Receiver measurement software	1
	Option 310	Cellular receiver with internal GPS	1
	Agilent 86154A	Drive system accessories	1
	Option 531	Briefcase carrier	1
Receiver-based measurement system the cellular band. Dead-reckoning and GPS. Carrying case for the system. You will provide your own laptop.	Agilent E7474A	Drive-test system	1
	Option 110	Receiver measurement software	1
	Option 300	Cellular band RF digital receiver	1
	Agilent 86154A	Drive system accessories	1
	Option 210	External GPS with DR	1
	Option 531	Briefcase carrier	1
Phone-based measurement system (single phone). Real-time mapping capability. Standard cable for the phone. You will provide your own PC and GPS.	Agilent E7474A	TDMA drive-test system	1
	Option 100	Phone measurement software license	1
	Option 160	Real-time mapping software license	1
	Agilent 86154A	Drive system accessories	1
	Option 730	Interface cable for the StarTAC TDMA phone	1
Add real-time mapping capability to an E7474A system you already have.	Agilent E7474A	TDMA drive-test system	1
	Option 160	Real-time mapping software license	1

Table 3. Typical ordering configurations (continued)

Desired system capability	You need to order:	Description	Quantity
Combined phone- and receiver-based measurement system for the cellular band (single phone). Standard cable for the phone. You will provide your own GPS, laptop, and StarTAC TDMA phone.	E7474A	Drive-test system	1
	Option 120	Combined phone- and receiver-based measurement software	1
	Option 300	Cellular band RF digital receiver	1
	86154A	Drive system accessories	1
	Option 730	Interface cable for StarTAC TDMA phone	1
Combined phone- and receiver-based measurement system for the cellular band (two phones). Internal GPS. Powered cable for each phone. Carrying case for the system. You will provide your own laptop, and StarTAC TDMA phones.	E7474A	Drive-test system	1
	Option 120	Combined phone- and receiver-based measurement software	1
	Option 150	Multi-phone measurement capability	1
	Option 310	Cellular receiver with internal GPS	1
	86154A	Drive system accessories	1
	Option 531	Briefcase carrier	1
	Option 731	Powered interface cable for StarTAC TDMA phone	2
Combined phone- and receiver-based measurement system for both cellular and PCS bands (two phones). Powered cable for each phone. Carrying case for the system. GPS, dead-reckoning and laptop PC included with the system. You will provide your own StarTAC TDMA phones.	E7474A	Drive-test system	1
	Option 120	Combined phone- and receiver-based measurement software	1
	Option 150	Multi-phone measurement capability	1
	Option 300	Cellular band RF digital receiver	1
	Option 310	PCS band RF digital receiver	1
	86154A	Drive system accessories	1
	Option 010	Laptop PC	1
	Option 210	External GPS with DR	1
	Option 531	Briefcase carrier	1
	Option 731	Powered interface cable for StarTAC TDMA phone	2
Phone-based measurement system (single phone). Indoor measurement capability. Standard cable for the phone. Fujitsu pen tablet computer for indoor measurements. Extra battery for pen tablet. You will provide your own StarTAC TDMA phone.	E7474A	Drive-test system	1
	Option 100	Phone measurement software	1
	Option 180	Indoor measurement software	1
	E6473A	Drive system accessories	1
	Option 330	Fujitsu pen tablet computer	1
	Option 334	Pen tablet battery kit	1
	86154A Option 730	Interface cable for StarTAC TDMA phone	1
Receiver-based measurement system for the cellular band. Indoor measurement capability. Fujitsu pen tablet computer for indoor measurements. Ability to carry all necessary measurement equipment for indoor measurements in backpack.	E7474A	Drive-test system	1
	Option 110	Receiver measurement software	1
	Option 180	Indoor measurement software	1
	Option 300	Cellular band RF digital receiver	1
	E6473A	Drive system accessories	1
	Option 330	Fujitsu pen tablet computer	1
	Option 334	Pen tablet battery kit	1
	Option 020	Portable direct connect hub kit	1
	Option 040	Single receiver carrying case	1
Combined phone- and receiver-based measurement system for the cellular band. Standard cable for the phone. Indoor measurement capability. Fujitsu pen tablet computer for indoor measurements. Ability to carry all necessary measurement equipment for indoor measurements in backpack. You will provide your own StarTAC TDMA phone.	E7474A	Drive-test system	1
	Option 120	Combined phone- and receiver-based measurement software	1
	Option 180	Indoor measurement software	1
	Option 300	Cellular band RF digital receiver	1
	E6473A	Drive system accessories	1
	Option 330	Fujitsu pen tablet computer	1
	Option 334	Pen tablet battery kit	1
	Option 036	Universal serial bus hub	1
	Option 020	Portable direct connect hub kit	1
	Option 040	Single receiver carrying case	1
	86154A Option 730	Interface cable for StarTAC TDMA phone	1

Additional literature

Configuration guides

E7474A TDMA Drive-Test *5968-5861E*
E7475A GSM Drive-Test *5968-5563E*
E7490A CDMA Over-Air Maintenance Tool *5968-8696E*

Technical specifications

E7473A CDMA Drive-Test *5968-5555E*
E7474A TDMA Drive-Test *5968-5556E*
E7475A GSM Drive-Test *5968-5564E*
E7477A cdma2000 Drive-Test *5980-2306E*
E7490A CDMA BTS Maintenance Tools *5968-8687E*
E7490A CDMA Over-Air Maintenance Tool *5968-8697E*

Product overviews

E7473A CDMA Drive-Test System *5968-8691E*
E7476A W-CDMA (UMTS) Drive-Test System *5980-2132E*
E7477A cdma2000 Drive Test System *5980-2131E*
E7478A GPRS Drive-Test System *5980-2375E*
E7490A CDMA Over-Air Maintenance Tool *5980-0721E*
Indoor Wireless Measurement Systems *5968-8691E*
Wireless Data Measurement *5980-2310E*
Agilent Indoor Wireless Measurement Systems *5968-8691E*

Product Notes

E7473A CDMA Drive-Test Product Note *5968-5554E*

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